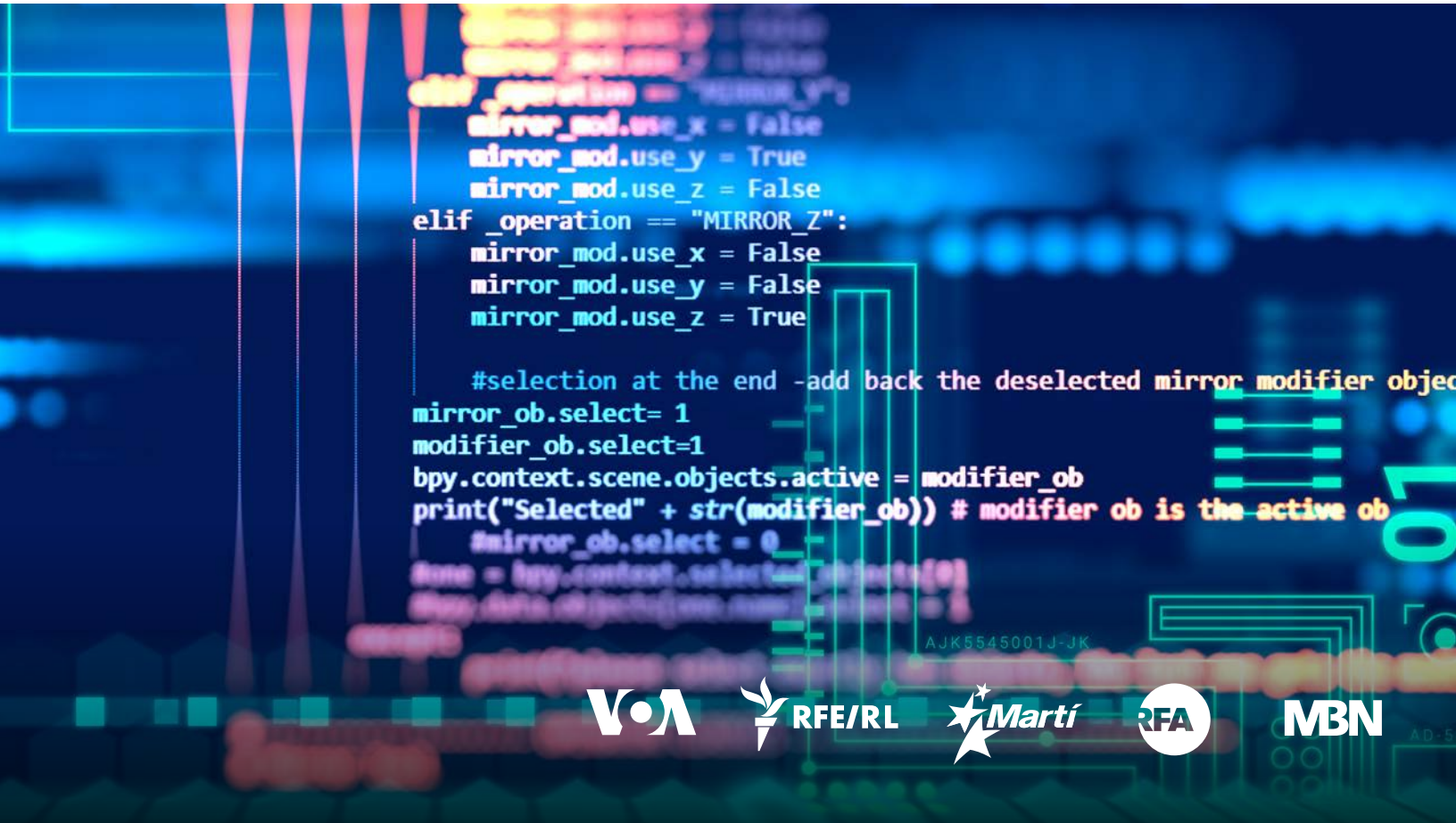
Broadcasting Board of Governors

ANNUAL REPORT 2016

TECHNOLOGY, SERVICES & INNOVATION



Broadcasting Board of Governors

TECHNOLOGY SERVICES AND INNOVATION
2016 ANNUAL REPORT

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Letter from the Director

In 2016, TSI continued to support the 24/7 activities of the five BBG networks, managing support services, operating global content distribution systems, running and substantially upgrading its networks and IT infrastructure, and operating the historic Cohen Building. Especially impressive is TSI's superior reliability, delivered with a historically smaller budget, while delivering BBG content to a record-setting large audience.

TSI's entire purpose is to support the systems, applications, and tools that allow the five BBG broadcast entities to do their jobs—gathering, producing, and telling the news to our 278 million-strong global weekly audience. Our platforms, systems, and networks reliably deliver hundreds of radio shows and dozens of TV programs, live and on demand, as well as hundreds of thousands of web stories, social media posts, and tens of thousands of live streaming sessions every week.

Beyond the day-to-day work of keeping our core systems running, TSI led or partnered with other organizations in the agency to develop and deploy new tools and innovations that are moving the agency forward in dramatic ways. For example, MPLS (Multiprotocol Label Switching)—a type of data-carrying technique for high-performance networks—and an upgraded satellite compression standard called DVB-S2 made it possible for the agency to significantly expand its content transport capacity, supporting the Agency's migration to HD, at no additional cost.

This report provides details on how TSI's divisions—from Telecom to Broadcast Technologies, from Facilities to Network Security and all other TSI areas—have helped advance BBG's mission and empowered every person and organization in the agency to achieve more. I am proud of the work TSI has done and wish to thank all of its employees who worked so hard to make 2016 another watershed year. Your efforts have also built a sturdy foundation for an even brighter future, so I am looking forward to seeing how much more we will continue to raise the bar in 2017.

Onward and upward!

André V. Mendes
CIO/CTO, BBG|
Director, Technology, Services & Innovation, IBB

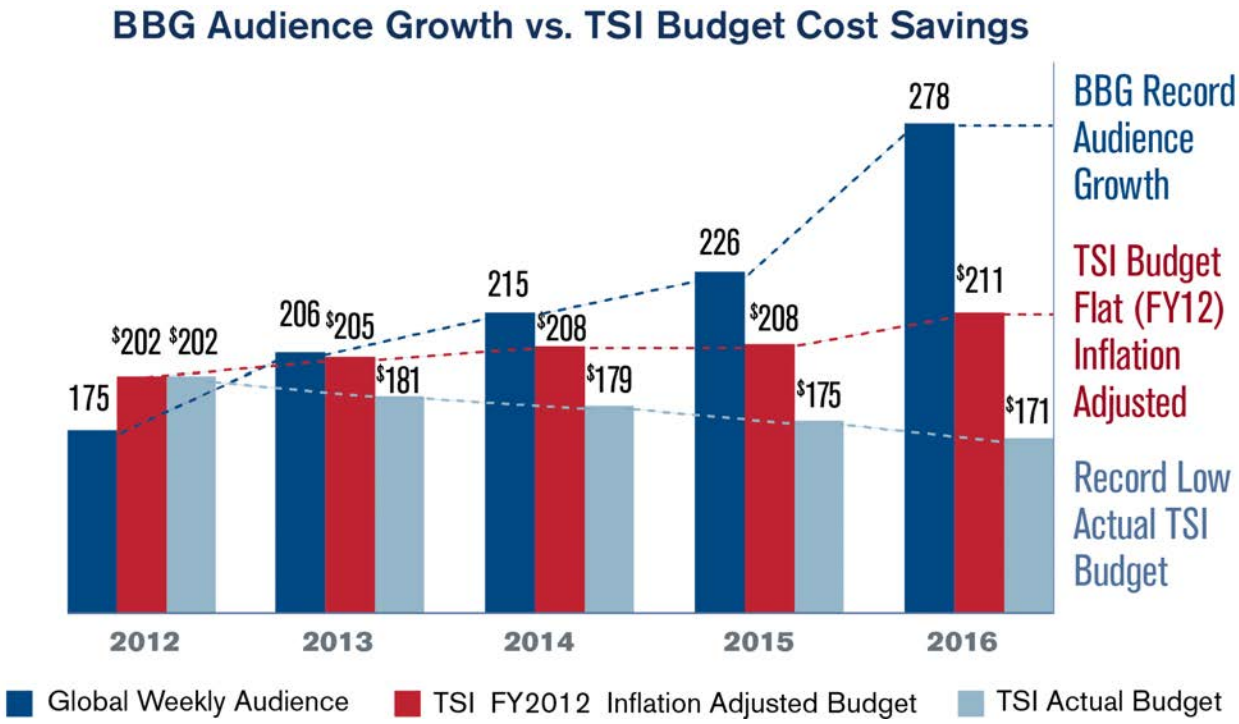
Executive Summary

"Better, Faster, Stronger"

TSI's primary mission is to enable the acquisition, creation, and distribution of content created by the five BBG broadcasters to their intended audiences in the most cost-effective, reliable and efficient way. Here are some of the significant efforts on this front that were realized or continued in 2016:

Cost Savings, plus more Efficient Performance Free Resources to Support Network Missions

- TSI's overall budget and workforce size are at historic lows, yet delivery of service, stability of the network, and breadth of distribution in reaching record audiences are impressively high, a combination unprecedented in government settings.
- While supporting record global audience growth, TSI has substantially decreased its operating costs. At $171 Million, TSI's 2016 actual budget is **$40 million (or 19%) lower** than if it had stayed flat at 2012 inflation-adjusted numbers. Cumulatively, since 2012, TSI has **shaved a total of $126 million** from its cost base, directly enabling additional investment in the BBG's five broadcast entities. Undoubtedly, this is record performance for any setting in or out of the federal arena.



- Space consolidation on the 4th floor of the Cohen building–driven by TSI and precipitated by BBG's need to vacate the Switzer building–has yielded new and improved workspace, conference rooms, and "care" rooms for hundreds, and enabled the renovations and expansions for the Offices of Contracts, Security, Human Resources, and the Africa Division. As of April 2017, **cumulative savings** to the BBG and the US taxpayer from this project exceed **$7.8 million**.

Expanded Distribution Helps Networks Increase Audience

- Additional FM stations in Niger and the Democratic Republic of Congo, supported with dedicated IT infrastructure in DC, deliver VOA content to five more key African cities, providing audiences with 24/7 streams of VOA news, interactive shows, and dynamic music programming. These FMs stations greatly contributed to VOA's audience increase.

Strategic Technical Investments Prepare Agency For Better Performance

- Further strengthening of the agency's media asset management system reduced incidents and service requests, enabled the handling of HD video and laid the foundations for a major Dalet upgrade in 2017.
- Working with VOA BOPS, TSI achieved several key infrastructure and distribution milestones in an on-going effort to upgrade VOA TV to full HD, and secured funding for the long overdue system replacement of Radio Master Control.
- The new, state-of-the-art Network Control Center facility in the Cohen building improves the team's ability to track and monitor an unprecedented number of TV and radio programming streams around the clock.

Supporting BBG's Workforce with Better Work Environments & Technology

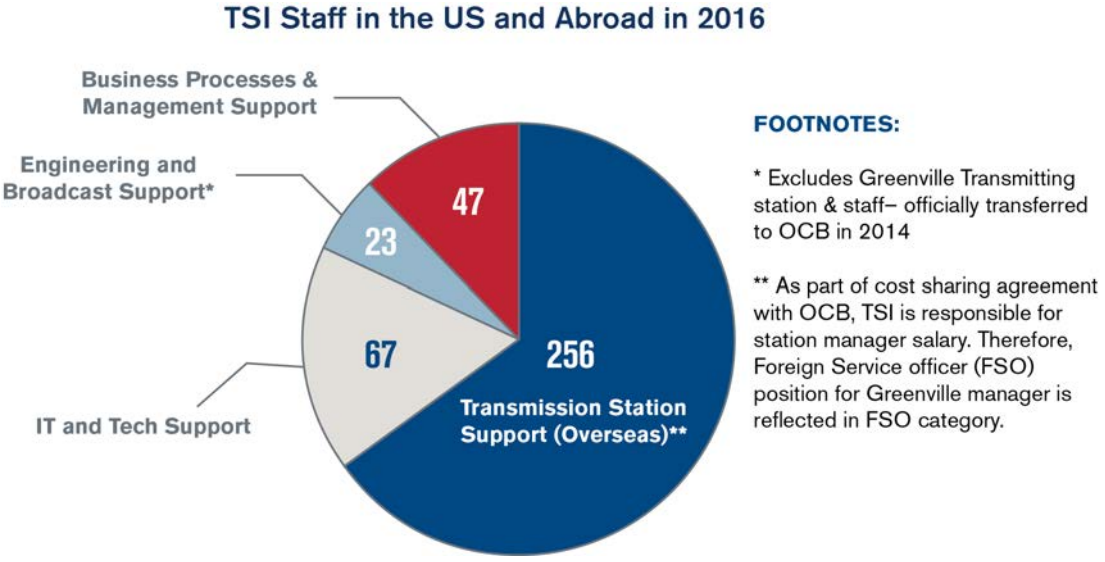
- TSI's Facilities group completed over 250 office moves and renovated more than 100,000 square feet of office space, providing cleaner, more attractive and far more economical workspaces for BBG employees.
- The availability and robustness of Wi-Fi service inside the Cohen building was dramatically expanded with the addition of over 600 additional wireless radios.
- The provision of hundreds of mobile devices to broadcast staff to enhance newsgathering and ease communications has enabled VOA language services to dramatically increase original video production capability, both for TV and online.
- Hundreds of extremely popular stand-up desks were distributed and installed.

Protecting the Agency from Cyber-Security Threats

- Amidst a troublesome global cyber security environment that saw some of the highest profile people and institutions experience major incidents, TSI's IT Security team led the Agency through yet **another year without any server compromises**. This was in large part because of investments in improved monitoring and defense capabilities, as well as ongoing user education about phishing attempts and malware.

Our Operations

In 2016 TSI obligated almost $171.5 million in annual operating funds on activities that support the agency's mission. Additionally, more than $6.8 million was obligated in the Broadcasting Capital Improvement appropriation and $7.4 million devoted to Internet Freedom activities.



TSI's staff is focused on four key aspects of the BBG's operations:

- **IT and Tech Support:** The largest group of DC-based staff provides technical support to the Cohen building's user equipment and enterprise IT infrastructure, including networks, broadcast and back office applications, storage capacity and networks (wired, wireless, Internet and MPLS).
- **Business Processes and Management Support:** The next largest group works directly on administrative and management issues related to TSI operations, as well as supporting a number of agency-wide business processes, such as Sharepoint, AgLearn, WebTA, and ePerformance.
- **Engineering and Broadcast Support:** Nearly two dozen people in Washington engineer the agency's transmission facilities, from the massive-scale global SW and MW sites to dozens of FM stations, and support other broadcast operations, including satellite distribution.
- **Transmission Support:** Most TSI staff actually work outside the US at the BBG's many transmission facilities. There, a few Foreign Service Officers oversee hundreds of Locally Employed Staff (LES) in keeping 14 major, aging installations operating effectively and efficiently, despite diminishing maintenance and repair funding and other challenges.

Telecommunications

Throughout 2016 TSI's office of Enterprise Telecommunications (T/CT) worked closely with VOA journalists to enhance mobile newsgathering capabilities.

• T/CT increased the total number of mobile devices by 28% and outfitted journalists with upgraded, high-capacity iPhone 6S and iPhone 6S Plus that now enable VOA staff to shoot HD-quality video.

• T/CT's robust loaner phone program demonstrated its flexibility to accommodate over 260 requests during critical news periods, helping journalists cover events from the political conventions in Pennsylvania and Ohio to the Olympics in Brazil.

• 2016 introduced the widespread use of wireless modems to support VOA's Teradek modems and provided multiple streams of HD video beamed straight into the control rooms in Washington, bringing timely live standups directly into VOA's news broadcasts.

• Skype for Business connected journalists with sources around the world and provided a platform for collaboration with editors and producers in the Cohen building, helping VOA tell America's story.

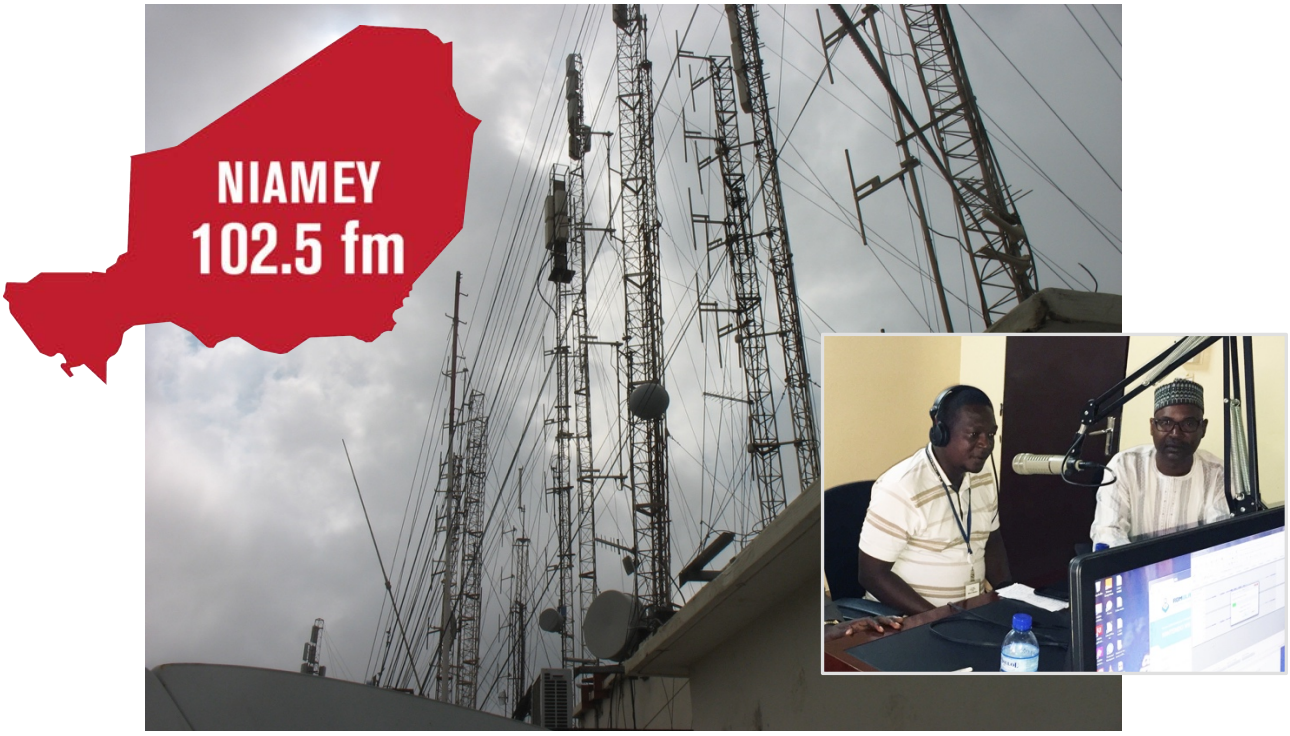
• T/CT developed a system to manage better the deployment of critical mobile applications such as FilmicPro, iMovie, and TapeACall to journalists' devices to produce stories in the field from start to finish.

Broadcast Technologies

TSI's Broadcast Technologies division engineers and supports the BBG's 90+ transmitting sites around the world, including shortwave, medium wave, and FM.

Though the audiences for shortwave radio continue to decline, the extensive TSI transmission network successfully supports the remaining need. Additionally, FM radio remains a strong, even growing, platform in many BBG markets. Global weekly radio audiences increased by a stunning 28 million in 2016 alone and by 35 million since 2012.

In 2016, TSI installed new FM transmission sites in five key African cities (see map on following page) and provided technical support for new customized, highly-targeted audio streams enabling VOA's Africa Division to deliver programming on this very important platform in French, Swahili, and Hausa to millions of new potential listeners.



FM Installations, like the one in Niamey, Niger provide a popular local platform for VOA to reach specific audiences with engaging and interactive programming, such as a Hausa language show produced in Niamey (right) and the potential to broadcast targeted breaking news, featuring local news assets.

In 2016, four FMs were launched in the Democratic Republic of Congo.

Responding to Emergencies

TSI also engineers broadcast solutions to address urgent crises. In 2015 TSI and IBB visited Ukraine to assess broadcasting needs in the ongoing conflict with Russia, and in 2016 followed up with a shipment of three rapidly-deployable FM systems, a 440' tower and a 50 kW medium wave transmitter. A further visit is planned to Ukraine in support of the donation of transmission equipment to the Government of Ukraine bolstering their domestic broadcasting capability during the current crisis. These efforts directly support the Ukrainian efforts to battle misinformation being broadcast in the occupied areas.

In October 2016, when Hurricane Matthew knocked out or debilitated some VOA FM radio affiliates in Haiti, TSI added additional shortwave time and frequencies to help ensure that VOA's Creole service news and other programming continued to reach audiences on the island. TSI also worked hard to make repairs directly for key affiliate stations to get them back on the air.

Jamming Monitoring

BBG maintains an extensive worldwide monitoring network to verify the quality of its transmissions and to detect intentional and unintentional interference. In August, intentional interference with BBG radio transmissions to Ethiopia was detected. With daily monitoring information, BBG was able to modify transmission parameters to mitigate some of this interference to a limited degree, and additional frequencies were provided to overwhelm Ethiopia's jamming capacity.

Network Realignment

TSI continues to implement its Network Realignment Strategy as it adjusts to the rapid worldwide technology revolution that is changing the global media landscape.

For many years, shortwave (SW) radio was the best, and often only way to reach audiences around the world. But, as broadcasters have long known, SW listening drops off considerably when local FM radio stations appear. While the BBG and other international broadcasters have found that SW remains effective in reaching many audiences whose access to honest news and information is most restricted, the rise of local FM radio and mobile phones is further reducing the viability of SW in most markets.

Moreover, most of the BBG's radio transmission assets are quite old (the average is over 34 years old) and increasingly difficult and expensive to maintain. Many transmitting stations—often exposed to corrosive salt-water vapor, frequent and severe tropical storms, age-related deterioration, and aggravated by many years of inadequate maintenance and repair funding—are showing serious maintenance issues. The cost implications of maintaining this aging network are significant, especially considering relatively high continuing demand for these services.

Thus, when storms hit the Sri Lanka Transmitting Station and caused $5-8 million in damage, the BBG—being unable to fund those repairs—decided it was time to shut the station down. All programming was shifted to other stations in June 2016 and the entire facility was closed down in record time by the end of 2016.

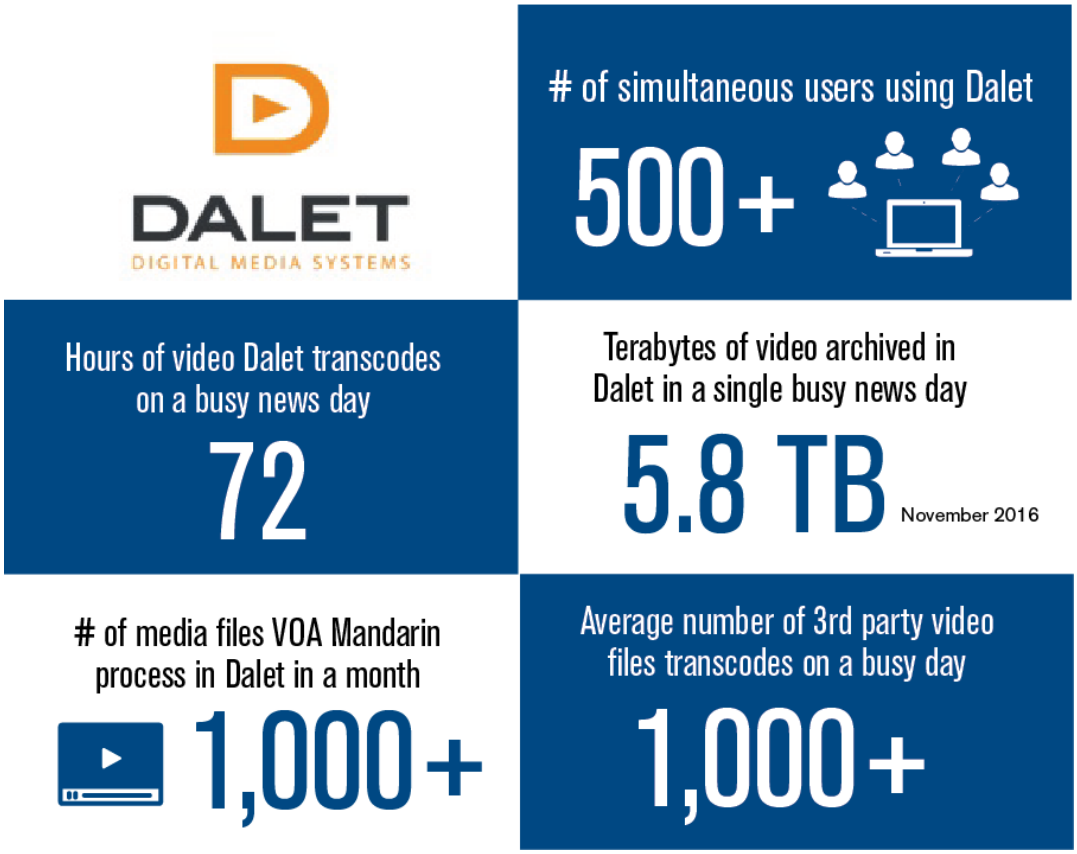
While no other stations have been specifically designated for closure at this time, with maintenance and operations costs still climbing and audience demand for SW continuing to decline, TSI will continue to realign the agency's distribution network to address the rapidly-evolving global media consumption landscape.

BBG decided to close the Sri Lanka transmitting station down after storms cause millions of dollars' worth of damage. Following the decision, technicians cut apart damaged towers and packed up the transmitters and other equipment to redeploy or use as spare parts elsewhere (right).

Media Asset Management

TSI's Digital Management Division (DMD) administers VOA's digital media system, the largest and most complex Dalet installation in the world.

Here are a few numbers that demonstrate just how big and complex VOA's Dalet installation is:



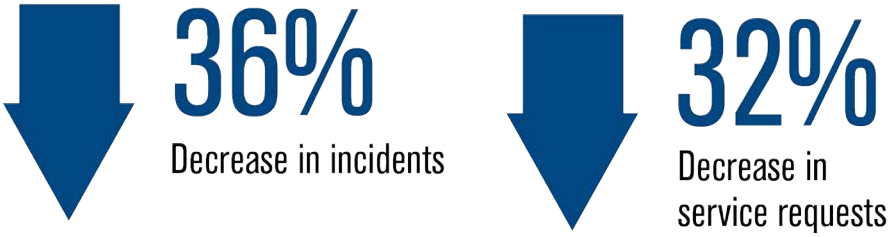
* Terabyte is a trillion bytes and a byte represents a single character.

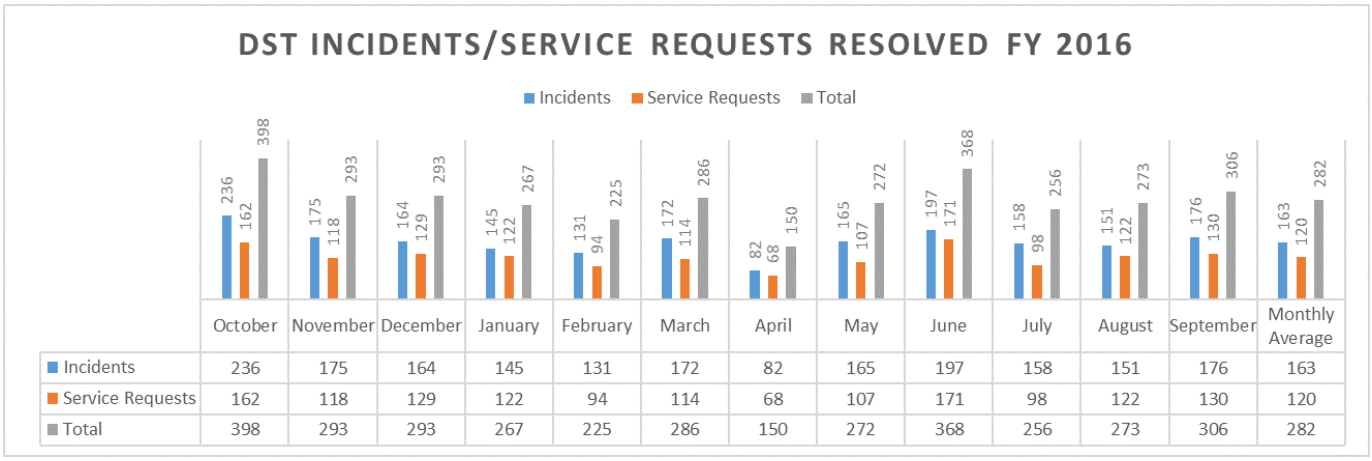
Dalet Upgrade Coming in 2017

DMD also laid groundwork in 2016 for a major upgrade of VOA's Dalet system that will better handle HD video and integrate radio/audio production tools while also radically improving publishing to social media platforms.

Supporting Dalet Users: Improving Service, Communication & Training

The Digital Media Support team that administers Dalet and responds to service requests did a fantastic job in 2016, and saw nearly a 36% decrease in incidents from 2015 and a more than 32% decrease in service requests. The decrease stemmed from changes that brought outstanding stability to the Dalet system, better communication, as well as better and more frequent training of users.





	October	November	December	January	February	March	April	May	June	July	August	September	Monthly Average
Incidents	236	175	164	145	131	172	82	165	197	158	151	176	163
Service Requests	162	118	129	122	94	114	68	107	171	98	122	130	120
Total	398	293	293	267	225	286	150	272	368	256	273	306	282

The team recognized that user error accounted for as much as 25% of both Incidents and Service Requests. Taking a proactive approach in recognizing this trend and helping our users cut down on wasted time so they can better meet their deadlines, the team began tracking these statistics and passed commonly seen errors on to the VOA Dalet trainers so they could include additional training. TSI also assists users with tips and tricks as well as recommended workflow processes to help them succeed.

Facilities and Space Management

In an on-going effort to maximize and improve working space in the Cohen Building, TSI's Facilities team managed several large moves and renovations in 2016. That brought the entire VOA Africa Division together on the first floor, relocated Human Resources in a redesigned wing of the fourth floor, and added meeting space and new working areas for the office of Business Development units on the third floor.

The new space for VOA's Africa Division houses six language services, meeting rooms, and studios. The previous occupants of the space, the Office of Human Resources, also moved into newly remodeled space on the 4th floor

Facilities by the numbers in 2016:

Trouble Calls Addressed
7,500+

Office Moves Completed
250+

Square Feet of Office Space Renovated
100,000

# of Heating, Ventilation and Air Conditioning, plus electrical distribution equipment maintained in good working condition*
350

Square Feet of Carpets Cleaned
200,000

Number of copiers replaced
40 out of 70
All copiers are now less than 2 years old

* Some of this equipment is original from the Cohen building's construction in 1938.

Network Control Center

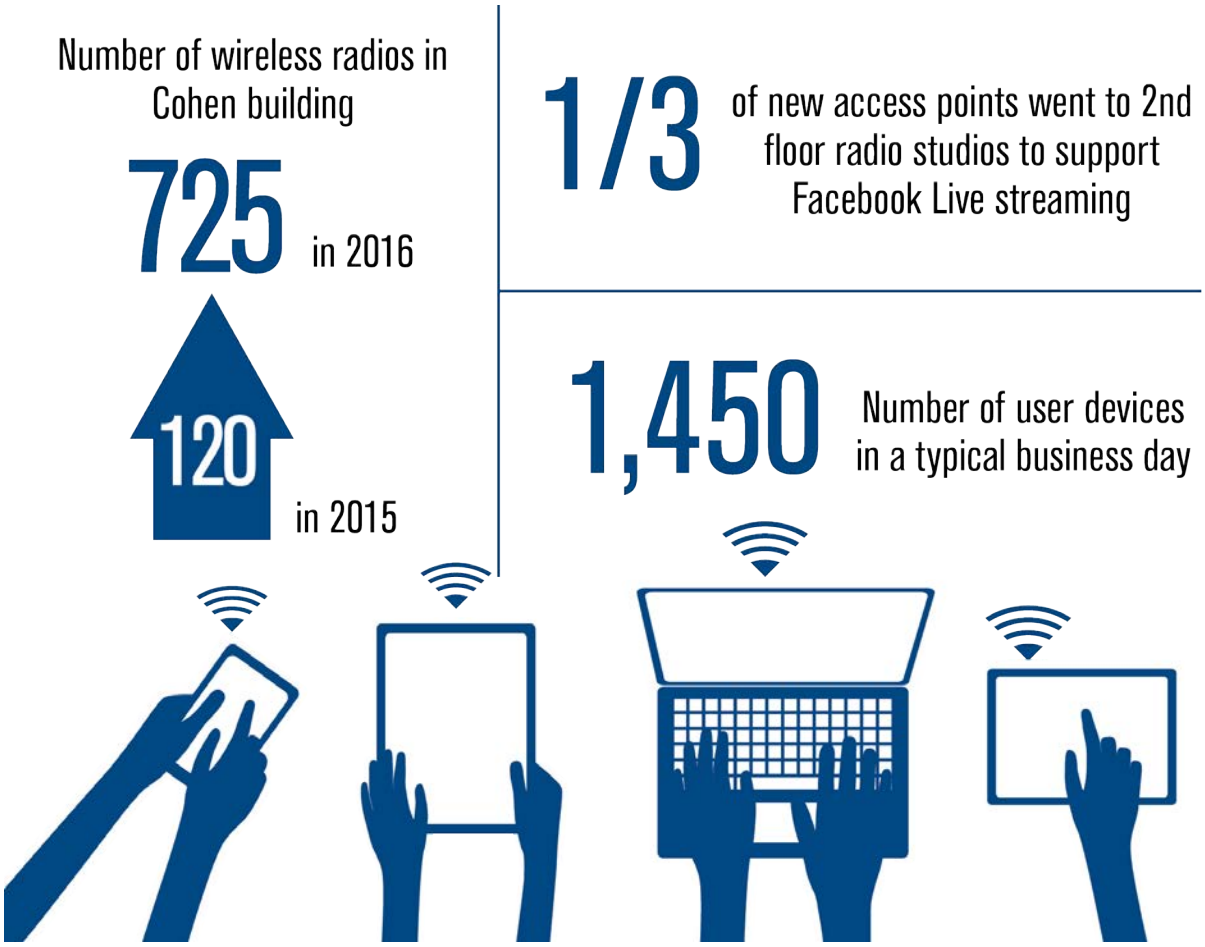
The newly deployed Network Control Center (NCC) is a state-of-the-art facility that allows TSI technical staff to track and monitor the distribution of dozens of TV and hundreds of radio programming channels originating from, and to, all five BBG Broadcast entities. A final two-month sprint of intensive cable and equipment installation in 2016 concluded years of heavy construction and renovation to complete the NCC facility. It was a challenging, complex project, as thousands of connections had to be launched in perfect sequence and several decades of undocumented legacy cabling had to be replaced and removed.

2016 also saw another important technical advance. Working closely with Broadcast Technologies and the Global Networks Division, the NCC staff upgraded the modulation scheme used on the Atlantic Ocean Region (AOR) satellite MCPC signal. In short, TSI achieved greater channel capacity and better signals at no additional operating cost. This and other technical enhancements will greatly benefit delivery of both audio and video content to BBG's FM stations and affiliates throughout Africa.

Technicians in the new, state-of-the-art NCC monitor dozens of live TV and radio feeds.

Wireless Connectivity

In 2016 TSI expanded wireless access in the Cohen building:



Supported app access to allow broadcasters to call and text internationally from their mobile devices

To support newsgathering, TSI adjusted the network firewall to permit running WhatsApp, Viber, and TeamViewer, applications that let broadcasters send free text and make free phone calls around the world.

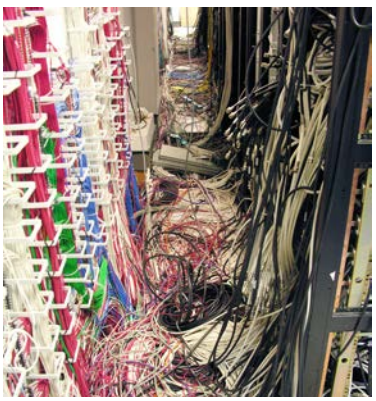
Support to Renovate Radio Master Control

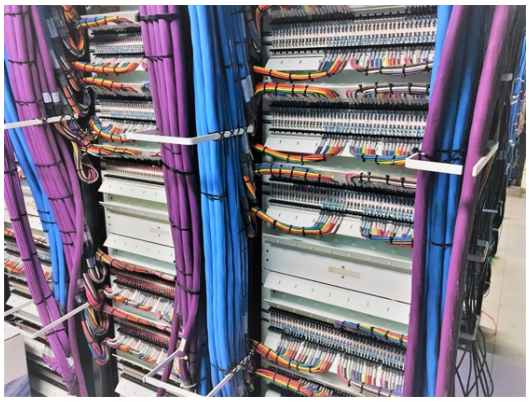
TSI's Project Management Office (PMO) is coordinating the VOA Broadcast Ops and TSI joint effort to upgrade Radio Master Control. By the end of 2016 several important milestones were reached, including the establishment of operating standards, the purchase of several key components, and the sorting and labeling of thousands of wires and cables. Those efforts, along with the renovation of the new space, will allow Radio Master Control to handle and monitor programming far more efficiently when the project completes in 2017. Funding for this VOA project was provided by the proceeds of sale of the Erching property in Germany. Idle for over three decades, the property was sold in 2011 for $6M (double the original estimated value).

The current VOA Radio Master Control room (above) continues to serve while the new space is prepared.

Like night & day:

Perhaps the most striking change can be seen with the new cabling racks, which have been carefully installed. Old wiring (left) versus new cabling (right) make for easier, faster troubleshooting and replacement of wires and other parts.

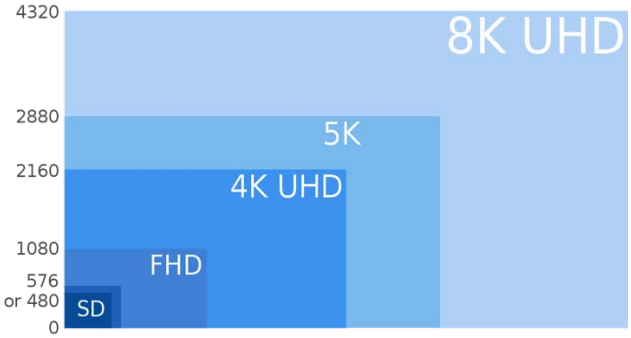




Support to HD Migration

Since July 2014, when BBG upgraded its TV aspect ratio to 16:9, TSI and VOA Broadcast Operations have reached several key milestones to migrate TV from standard to full high definition (HD) programming and distribution. Milestones completed were:

- **Dalet workflow tests were completed**
- **HD format was identified and an appropriate CODEC was established.**
- **In 2016 contributed $1 million in funding to VOA, helping to obtain HD cameras, four channels of TV Master Control automation, and transmission equipment.**
- **TSI also switched to a new encoding system (DVB-52) on one of the satellites, which permits an additional 4 or 5 Mbps of data using the same number of channels. In other words, much more data can be pushed through the same capacity for no additional cost.**



As the number of pixels in a video image grows, the studio, IT, and distribution infrastructure to produce, store, and transmit the video must also grow.
Some key parts of the infrastructure TSI and VOA Broadcast Operations are procuring and installing will permit seamless growth from full HD into 4K UHD and beyond (see chart above).

HDTV routers installed in TV Master Control
TV master control (TVMC) is the technical hub of VOA's TV broadcast operation. It is the final point before VOA's TV programs are distributed for broadcast. These routers are required to carry HD video data through master control and to the NCC for distribution via satellite and MPLS to TV station affiliates, satellite TV providers, and direct-to-home viewers.

Business Process Support

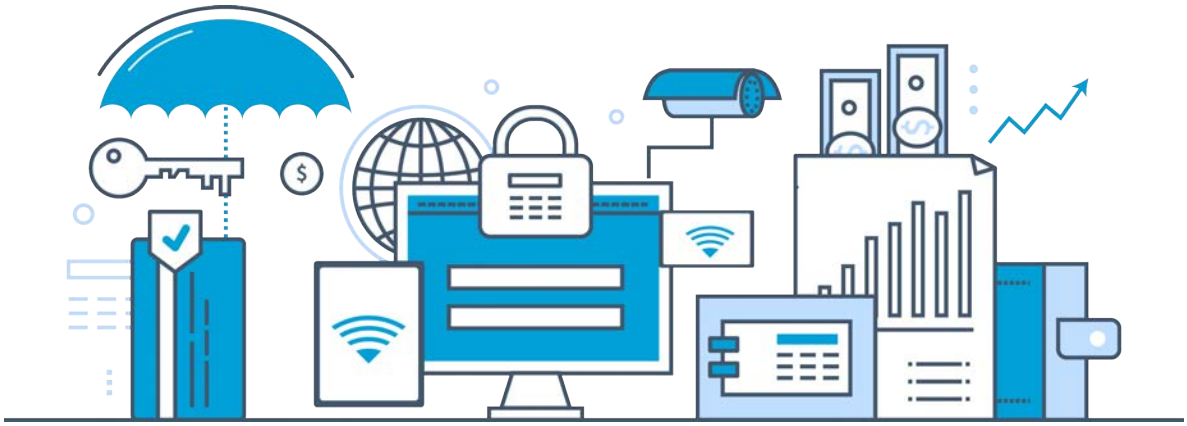
WEBTA™

TSI's Project Management Office (PMO) worked with the payroll team in OCFO to deliver WebTA, an online time and attendance system that addresses the Executive Office of the President requirement for federal agencies to begin using cloud-based applications and standardize how employees submit their time throughout the agency. All employees will be able to submit their time and to request leave via a browser: while they are physically on site in the Cohen building; while teleworking; when working from a remote site, or in the event of a disaster recovery (DR) incident. This initiative will also assist in bringing the CFO's office into better compliance with the annual Time & Attendance audits. The system will reduce the error rates experienced when using manual entry into the current payroll system. This will help to reduce the Agency's exposure to accountability risk, as a third of the agency's budget is comprised of payroll.

aglearn+
adding to your knowledge

TSI's PMO also assisted the Office ofWorkforce Support and Development to consolidate to a common management platform for all BBG training activities, online and blended learning as well as internal and external classroom training. The deployed system allows for managing and monitoring of learning activities, while simplifying the experience for end users. AgLearn facilitates ease of student enrollment, provides enrollment and completion data for all courses and participants, and provides reporting compatibility with Office of Personnel Management (OPM) approved Federal HR systems.

IT Security



Cybersecurity

The threat of denial of service (DOS) attacks, phishing attempts, and malware are just some of the IT security threats that the BBG—as well as banks, hospitals, media companies, and other government agencies—combat every day. At the BBG, combating these threats is the job of TSI's Information Security Division.
When the agency's defenses identify a potential cybersecurity incident, it is IT Security that leads the BBG's response efforts. The team ascertains the nature of the incident and its severity, then mitigates the incident using appropriate techniques. When possible, the team also conducts forensic analysis of the incident and updates agency information systems to better defend against similar threats in the future.

Again in 2016, and despite the BBG being a favorite target of some of the world's most sophisticated, state-sponsored, cyber terrorists, the TSI IT team kept our servers free of any malicious cyber infection.

In 2016 IT Security continued to improve and reinforce the Agency's information security monitoring capabilities and defenses.

Working with the Department of Homeland Security, TSI's IT Security team continued to realign the Agency's internally owned and operated information security tools as part of broader planning and design efforts that will soon deliver improved federal cybersecurity defenses. TSI is also leveraging offerings from DHS to reposition BBG resources to fill key cybersecurity monitoring and defense gaps.

Information and Compliance

The IT Security team also led the BBG's information security and privacy compliance efforts. The team developed system security plans, conducted security assessments, and provided guidance for assessing hosted business systems. The team was also the primary point of contact for the Office of Inspector General (OIG) Annual Federal Information Security Modernization Act (FISMA) Audit and responded to all OIG data calls, questions, draft and final reports, and compiled and submitted the annual report to OMB.

Intranet Evolved

The Enterprise Applications Division's project to improve the agency's intranet has completed its work, including migration of data and enhancements to certain pages. The division has worked with several organizations in BBG, including the Office of Contracts, BBG Public Affairs, the Office of Administration, and others to develop more user-friendly, office-specific intranet portals.

The goal of the project was to migrate the intranet from on-site storage to cloud-based storage, so that employees can access the intranet anywhere they have internet access, thus aiding emergency and business continuity efforts.

In addition, Inside BBG—as the intranet is known—has been refreshed with a new look, better usability and more intuitive navigational schemes.

Media Training & Development

TSI's Media Training and Development office negotiated over $3 million in outside funds for BBG broadcasting and training in 2016. State Department, USAID, DOD and CDC all provided money to BBG. Projects included a continuation of the *South Sudan in Focus* daily radio program; countering violent extremism (CVE) projects in Mali and the Central African Republic; polio coverage and journalism training in Afghanistan, Pakistan, Ukraine and Nigeria; health reporting in DRC, Nigeria and Ivory Coast; conflict resolution programming in Burundi; Wolof content in Senegal; and journalism training in Jordan, Malaysia and Laos.

TSI trained over 1,000 international journalists and media professionals around the world as part of the agency's mission under the 1994 Broadcasting Act. Topics included sales and marketing, new television technologies, studio production, security, health and education.

$3 million

Negotiated funds for BBG broadcasting and training from outside sources

1,000+

Journalists & media professionals trained

Developing Journalists for Digital

Malaysia

More than 50 Malaysian journalists in Kuala Lumpur and Kota Kinabalu were trained on a wide range of special topics, from journalism ethics, the methods of investigative reporting, and how to use social media and the internet more effectively in storytelling.

Dominican Republic

VOA/BBG trained reporters, editors and management staff at various radio and TV stations in the Santo Domingo area of the Dominican Republic. The training emphasized business skills for managers and the future of radio in the digital era.

Senegal

Select students from journalism schools in Dakar, Senegal attended sessions designed to help them master news writing, reporting and radio production, plus use of new media tools and smart phone apps for promotion and audience growth. Some now contribute to content that airs on VOA's FM in Dakar.

Business Development

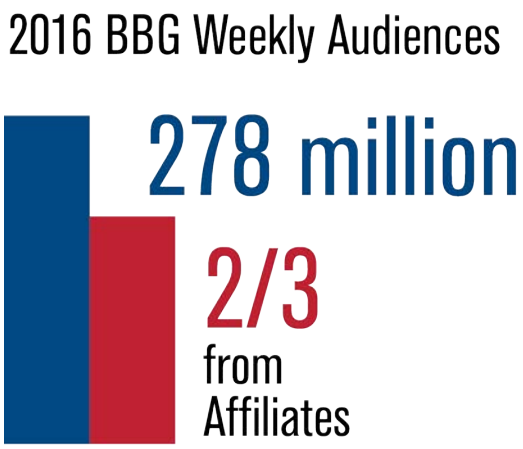
The office of Business Development's distribution component manages the business relationships with those outlets that find value in the content produced by the five brands of US International Media – on the air, online, and mobile. The mission states:

"We are…a market-driven, results-oriented organization dedicated to the meaningful, measurable growth of US International Media. It is our mission to strengthen and maintain IBB's global affiliate network through targeted high-impact affiliations, effective brand management, commitment and customer success consistent with BBG priorities."

And business in 2016 was good.

Fueling Audience Growth

Growth in affiliate audiences accounts for much of the growth in the past five years, from 175 million. The biggest increases have come in Indonesia and Latin America.



Collaboration Leads to Success in Distributing Current Time to Russian Speaking World

Business Development has been instrumental in distributing the joint RFE/VOA "Current Time" program and channel to Russian speakers worldwide.

The effort brings objective and comprehensive news and lifestyle programming to an ever-increasing list of cable, satellite and digital outlets.

It would be wrong to claim that the increases are based on Business Development's work alone. Collaboration with the BBG's content creators and TSI's distribution platforms are key to success in increasing audiences by the affiliation model. It all works best when broadcasters work collaboratively with business development and technology.

This would not be possible without the coordinated distribution efforts of Radio Free Europe/Radio Liberty, Voice of America, and TSI.

currenttime

Current Time is available to 7.3 million subscribers on cable and IPTV services in Ukraine, Georgia, Moldova, Latvia, Lithuania, Estonia, Kyrgyzstan, Tajikistan, and Kazakhstan.

Reaching Audiences in Highly-Rated Prime Time

Cooperation with affiliates puts our reporters and our news on to highly rated affiliates in their prime-time news broadcasts via "live shots" from Washington, or wherever our in-language correspondents are working. *Live from Washington* with TV Azteca in Mexico City accounts for more than ten million viewers each week, and similar live inserts happen with major affiliates in Indonesia, Nigeria, Uganda, Turkey, and elsewhere.

Business Development sees the distribution continuum as dynamic, from direct to audiences via shortwave, to radio and television broadcasts largely through affiliates, to direct access again via mobile and over-the-top (OTT) television platforms. Managing that transition while continuing to grow audience is the challenge.

VOA Spanish Lina Correa reports from the Supreme Court in Washington, DC.

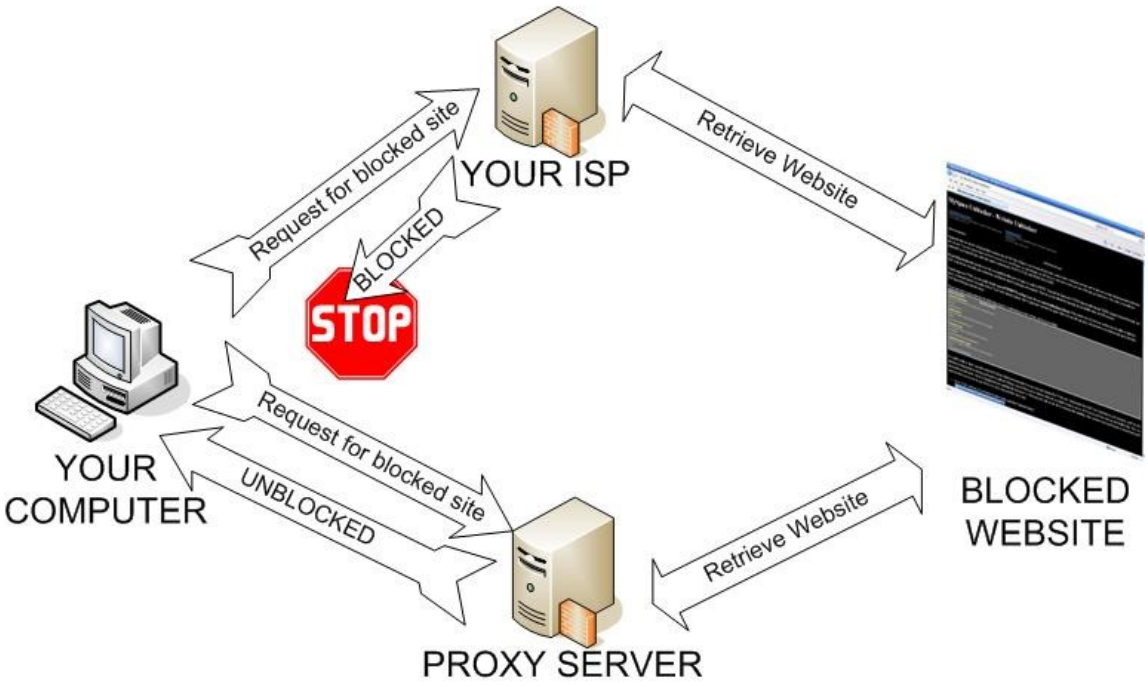
Internet Anti-Censorship

Digging Under the Great Firewall of China

Reaching audiences living under repressive governments is an ongoing challenge. Increasingly, repressive governments work together to jam radio and TV transmissions and block content online. To circumvent these efforts and promote Internet freedom for everyone globally, TSI's Internet Anti-Censorship (IAC) Division manages a variety of tools. The Division also works closely with BBG networks to ensure their audiences can access their content and are educated about Internet censorship.

In 2016, the Internet Anti-Censorship (IAC) team in TSI supported the continued growth of its programs across both desktop computers and mobile devices. The IAC team will continue in 2017 to provide web-based proxies and client software tools to circumvent foreign governments' Internet censorship. With the creation of the new BBG Office of Internet Freedom, the IAC program is likely to undergo changes in 2017 to focus jointly on the evolving strategy for Internet Freedom.

This simplified diagram shows how the BBG uses proxy servers to allow users to circumvent governments' firewalls and view content that would otherwise be blocked. A proxy server acts as an intermediary for requests seeking resources from other servers, facilitating anonymous access to the World Wide Web.



Technology Support Services

Out with the Old, In with the New

TSI's Computer Systems Support Division (CSS) provides help desk and desktop support to VOA, OCB, and IBB staff globally.

CSS by the numbers

In 2016 CSS completed the transition away from Windows XP, upgrading hundreds of machines to Windows 7 and 10, likely making **BBG the first Federal Agency to do so.** This was a major effort to enhance the security and functionality of workstations throughout the Cohen building. In addition, 325 new workstations with high-end specifications and additional RAM (memory) were installed to support multi-tasking and better enable work on HD video products. With the transition of Windows XP to Windows 7 and 10 and the replacement of End-of-Life computers, service calls for hardware support declined dramatically.

CSS made major strides in implementing and supporting several new technologies and initiatives that generated a large increase in customer demand. CSS continued to play a significant role in support of various products, services and new initiatives

delivered to the technical user community while still maintaining daily operations and responding to requests in a timely manner.

As CSS continues to expand its services, it strives to implement strategies and apply quantitative methods to assess, improve and manage customer support providing an innovative technology experience.

OneDrive

To build on this improved functionality and stability, OneDrive (Microsoft's cloud-based storage) was also made available, so that users could access files anywhere they had internet access.

What's Next?

TSI in 2017 and beyond…

TSI will continue its drive towards greater efficiency, delivering superior reliability and services for less money. This will be achieved by continuing to evolve away from those shortwave broadcasts that reach no substantial audience and redirecting savings to digital, television, and mobile technologies. Just some of TSI's major projects include:

- TSI will implement an upgrade to the Dalet Media Asset Management System called Galaxy. Galaxy will allow for better handling of HD video content and allow for seamless access to video and audio content for all users via the same interface.
- A major expansion of upgraded digital storage will begin in 2017 so that VOA can retain its HD video, files that are more or less double the size of standard definition video files.
- TSI Facilities will oversee enhancements to physical security at the Cohen building and continued improvements of working space.
- The offices of Enterprise Telecommunications and Technology Support Services will continue to roll out Skype for Business, OneDrive, and other cloud-based solutions that offer all BBG staff–from journalists to engineers to managers–tools that maximize productivity, minimize costs, and allow for greater staff mobility.

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